Staff Report
Two-way Traffic Flow Conversion Study
Market and Park Place (17th to 21st Street)

As part of the 21st Street Revitalization Study, the steering committee has requested that staff evaluate converting Park Place and Market Street to a two-way flow for the purpose of improving traffic circulation and flow within the area. The existing one-way flow along Park Place and Market from 17th to 21st Street was designated in the 1950's. In reviewing this measure, it is important to note that two-way flow changes would need to be made concurrently along both Market and Park Place. If only one of these streets is converted to two-way traffic flow, the converted street will carry additional traffic flow in the direction that the other couplet is not serving.

This following study evaluates the impacts of a two-way conversion plan along Market and Park Place. Included is a discussion of the business and neighborhood concerns, advantages/disadvantages of the existing one-way traffic flow, resulting traffic flow changes, proposed intersection and signal/sign modifications, and staff recommendations. These have provided the basis of discussions in the following sections included in the report.

- **Existing Conditions**
- **Business and Neighborhood District Concerns**
- **Advantages/Disadvantages of the Existing One-way Traffic Flow Plan**
- **Traffic Flow Impacts along Park Place and Market**
- **Traffic Signal/Sign and Intersection Modifications**
- **Summary**

Market Businesses

Existing Conditions

Currently, Park Place (Main) and Market Street are one-way flow couplets from Pawnee to 21st Street North. Traffic flow along Park Place is one-way, southbound, whereas flow along Market is one-way, northbound. Both Market and Park Place are collector streets by design and carry traffic volumes of approximately 2,000 vehicles per day (vpd) along sections between 13th and 21st Street North. The main purpose of designating Park Place and Market as one-way streets was to facilitate flow to the Central Business District and to provide minor "reliever" routes for Waco and Broadway. The resulting impact to these two major streets, however, is negligible since both Park Place and Market carry significantly less traffic than originally planned.

The stop control plan along Park Place and Market Street provides for unimpeded flow along four block segments between 13th Street and 21st Street. Along this route, motorists are able to travel four (4) blocks from 13th Street to 17th Street, and from 17th Street to 21st Street without stopping at either a traffic signal or a stop sign.

Currently, the posted speed limit along both Park Place and Market Street is 30 mph. This is similar to the speed limit along local streets, as well as minor collector streets. Staff has recently collected speeds along Park Place at both 15th and 19th Street. This effort consisted of sampling more than 100 vehicle speeds at both locations during a weekday daylight period. Speeds sampled included only free-flow speeds of motorists who were not impeded by other vehicles or obstacles. According to this analysis, average travel speeds were 30 and 32 mph, respectively, for southbound motorists at 15th Street and 19th Street.

Market/17th Street Intersection

Business and Neighborhood District Concerns

Market and Park Place streets are intended to provide several essential needs for the business districts and neighborhoods along this section from 17th to 21st Street. These needs include access, parking, pedestrian facilities, and other accommodations. Due to existing conditions, both businesses and neighborhoods have expressed concerns that these needs are not met with the one-way flow conditions. These concerns are described in detail below.

Business District Traffic Flow Concerns

Business representative's main concerns with the one-way traffic flow are related to access and circulation. They have reported that their customers must now navigate longer and cumbersome routes along the existing one-way streets to their businesses. To illustrate this point in a recent meeting, a business person reported that to drive to a business on Market, customers driving eastbound along 21st Street must first turn a block west onto Park Place, then travel south one block, turn east on 20th Street to Market, and then head north one block to the Market business district. With a two-way flow, motorists would be able to turn south on Market and drive directly to businesses, reducing the existing route by 2 blocks.

Neighborhood Traffic Issues

Reported neighborhood concerns are with speeds and resulting accidents along Park Place and Market. These speeds may be influenced by the one-way street design along Market and Park Place since it does allow reported nuisance type activities including two-lane "drag racing", bypass traffic flows (caused by 21st Street train blockages), and "loop" driving in the evenings when young drivers circulate around the 18th-Park Place – 21st – Market Street loop. The conversion of Park Place and Market to two-way streets may reduce these activities because it would introduce "constraining" opposing flows in the adjacent lanes. Traffic speeds may also be reduced since drivers will have additional "friction" provided by the bi-directional traffic flow.

It should be noted that in the past several years, traffic improvements have been implemented to mitigate the traffic speeds and reckless driving within this neighborhood. Due to the past accident experience involving motorists running the stop control on Park Place at the 17th Street intersection, the City has installed additional warning and other signs to improve the recognition of this control. This included placing advance "stop ahead" warning signs, large 36" stop signs, flags, and chevrons along the east curb on Park Place south of 17th Street.

Advantages/Disadvantages of the Existing One-way Traffic Flow Plan

There are advantages and disadvantages of a one-way traffic flow plan. The advantages of a one-way traffic flow include increased capacity, traffic speeds, and reduction of certain intersection accidents. These benefits are typically tied to heavy traffic corridors where volumes exceed 8,000 to 9,000 vehicles per day (vpd) and impact capacities along a two-way street. Because both Market and Park Place carry approximately 2,000 vpd and are significantly under capacity thresholds, these advantages are not as prominent.

The other advantages for one-way street systems do not apply to the Market and Park Place street system. These advantages are ones beneficial for downtown business districts where heavier traffic flows along major "grid" type corridors exist with large left-turning volumes and closely spaced traffic signals. These one-way street systems are beneficial in these areas because of improvements to the traffic signal coordination, left-turning and pedestrian movements. Under these higher traffic and pedestrian conditions, total crashes can be reduced by 10-50%, especially ones that involve left-turns, rear-ends, and pedestrians.

There are also disadvantages of a one-way street operation that can be applied to the Park Place and Market Street corridors. This includes the following:

- Longer trip distances and, as a result, higher fuel consumption
- Higher speeds in residential areas
- More turns and the concentration of turns at certain intersections may strain street volume capacity
- Business owners, especially those that rely on passing traffic, may oppose one-way operation
- Lane changes and mid-block crashes may increase

Traffic Flow Impacts along Park Place and Market

In this evaluation, staff compared traffic conditions along similar two-way flow "collector" streets within the community with the ones along Park Place and Market. Similarities between these one-way and two-way streets included the street width, residential type areas, on-street parking, unimpeded travel length, and traffic volumes, among others. The two "two-way" collector street segments that were chosen for the comparison included Nims (Central to River Boulevard), and Murdock/Stackman (Nims to Museum Boulevard). Conditions that were evaluated in this 2002 comparison included speed, traffic volume, and accidents.

This comparison indicates that if most conditions are the same, traffic accident rates should not change if Market and Park Place were converted to two-way streets. When taking traffic volume into consideration, this evaluation showed that there were higher accident rates along Market and Park Place when compared with the higher volume two-way segments along Nims and Murdock/Stackman. This comparison shows that two-way flows along residential streets do not increase accidents, but may lower them because of the resulting lowered speeds and reduction of "nuisance" type activities including drag racing, loop driving, and others associated with local one-way streets.

Traffic volumes should not also change along Park Place and Market if these streets segments were converted to a two-way traffic flow. It should be noted that the two major north-south streets in the surrounding area, Waco and Broadway, carry the heavy through traffic with the approximate 7,000 and 12,000 vpd volumes, respectively. Since these heavy traveled major streets will not be impacted by this two-way flow conversion, there is little likelihood that heavy "through" volume will be diverted onto Market or Park Place. It is also believed that both resulting flows along Market and Park Place will remain at 2,000 vpd. These north-south streets are centered within the neighborhood area between Waco and Broadway and it is unlikely that traffic flow will be diverted from one street to the other.

Also in this evaluation, staff searched for studies performed in other cities where one-way/two-way conversions where implemented. In this search, it was found that three communities, including San Jose, California, Denver, Colorado, and Lubbock, Texas, had evaluated the conversion of one-way to two-way operations along streets within residential areas. Of these cities, only Lubbock had completed the one-way to two-way conversion. Currently, San Jose is still going through the process with a conversion plan that has been approved by City Council. The other community, Denver, Colorado, has implemented a different plan that includes

reducing the two-lane flow to one-lane and introduces parking along both sides of the street.

The City of Lubbock, Texas was very satisfied with the results of the traffic flow conversion. Study results showed that staff had not received any unfavorable comments except one request to improve the two-way signal progression. As expected, the number of collisions had increase by a small margin in a before/after study that had taken into account two years of data in each period.

Proposed Traffic Signal/Signage and Intersection Modifications

As part of this evaluation, staff has reviewed the traffic signal/sign and intersection modifications needed to accompany the two-way flow conversion along Market and Park Place. It should be noted that with a two-way traffic flow, wider traffic lanes are required to provide additional "buffer" space between the opposing lanes. Staff also reviewed stop sign visibility at 17th Street intersections, 21st intersection signal changes, and additional signage needed to alert motorists of a changed 2-way traffic flow along the corridor. Discussed below are the changes that should accompany the two-way flow change.

1. **Prohibiting parking along Park Place from 20th to 21st Street.** Currently, this Park Place street section accommodates on-street parking along both sides of this residential area. Due to the narrowed street widths along this particular section, on-street parking needs to be prohibited along one side of the street to increase the traffic lane widths from substandard 9 feet to an allowable 11 feet.

Park Place – 2000 Block

2. **Placement of two-way traffic flow signage and pavement arrows along Park Place and Market to alert motorists of the changed flow conditions.** Signage and pavement marking cost would be approximately $2,000 to install "2-way" warning signs along Park Place and Market to adequately alert motorists.

3. **Installing a traffic signal left-turn permissive/protected phase at the Market/21st Street intersection for westbound motorists on 21st Street if warranted.** This phase would alleviate congestion caused by the drivers making westbound left-turns on this short block section from Market to Broadway. Although this left-turn movement will be light, queuing will result in the peak periods because of the limited gaps afforded in the opposing eastbound traffic stream. Cost of this measure would be approximately $1,000 for the materials.

21st/Market Signalized Intersection

4. **Modification of the radius on the southeast corner of 21st & Park Place.** Another measure that is not required, but appropriate, is the modification of the south Park Place/21st Street approach to accommodate improved northbound right-turn movements. Due to the corner radii's, these right turns would be difficult and would involve motorists encroaching into the adjacent lanes when making these turns.

Park Place Approach onto 21st Street

Summary

Staff supports the conversion of a two-way flow along Market and Park Place to improve business access and traffic circulation. However, to be implemented, it is important that both the business and neighborhood districts also support the two-way flow changes along these two streets. It is believed that businesses located along Market and Park Place south of 21st Street would support the change since they have reported concerns about the existing one-way traffic flow that includes the increased travel time, distances, and associated difficulty for their customers to access their businesses. This two-way traffic conversion may also be supported by the neighborhood representatives who have complained about the prevailing speeds and accidents along these sections, which can be partly ascribed to the one-way flow operations along these streets.

Converting Market and Park Place to a two-way flow would necessitate changes along these corridors to meet safety needs. These modifications and associated costs area provided below.

1. **Prohibiting parking along one-side of Park Place from 20th to 21st Street.**

2. **Placement of two-way traffic flow signage and pavement arrows along Park Place and Market to alert motorists of the changed flow conditions (cost - $2,000).**

3. **Installing a traffic signal left-turn permissive/protected phase at the Market/21st Street intersection for westbound motorists on 21st Street (cost - $1,000).**

4. **Modifying the radius on the southeast corner of Park Place and 21st Street.**

A future initiative would be to consider extending the two-way traffic flow along both Park Place and Market further south to the 13th Street intersections. Only street segments between 17th to 21st Streets were considered in this evaluation to address concerns that both businesses and residents expressed about the traffic problems along this section. The two segments (i.e. 17th to 21st Street and 13th to 17th Street) are very similar in street and land use characteristics and resulting benefits would be very comparable. A separate traffic study would be conducted to assess speeds, volumes, and accident conditions along this segment if this measure was proposed.